



Representations of Animals in Research

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Representations of Animals in Research

Inserm Ethics Committee

"Animal Experimentation" Group

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Foreword

Animal welfare is one of the fundamental principles of the European Union. In the preamble to Directive 2010/63/EU of the European Parliament and of the Council of September 22, 2010 – the one that affects us directly because it concerns the protection of animals used for scientific purposes – point (2) reiterates that "Animal welfare is a value of the Union that is enshrined in Article 13 of the Treaty on the Functioning of the European Union." The animals explicitly referred to in the European texts are production animals, companion animals and research animals.

In France, Directive 2010/63/EU (see Appendix 1 for a link to the full text) came into force in 2013, replacing that of 1986 (86/609/EEC). Its purpose is to ensure a high level of protection for the animals concerned, with recital (10) stipulating that: "this Directive represents an important step towards achieving the final goal of full replacement of procedures on live animals for scientific and educational purposes as soon as it is scientifically possible to do so".

It continues to be acknowledged that full replacement is still not feasible, even if it is the medium to long-term objective towards which the various components of medical and biomedical research must work.

The adoption of Directive 2010/63/EU, which continues to legitimize but regulate the use of animals, led to a European Citizens' Initiative called "Stop Vivisection". Within a few months, it had obtained over 1 million signatures (Commission Communication of June 3, 2015) requesting the abrogation of the aforementioned Directive and an end to the use of animals in research. Although the initiative was rejected, the media and political impacts were inevitable. This raised the awareness of the research institutes concerned by these practices, such as some of the French Public Scientific and Technical Research Establishments (EPST)¹.

It was against this backdrop that the Inserm Ethics Committee, which was revived in 2013, tasked the "Animal Experimentation" Group with reflecting on the ethical issues raised by these practices. Drawing on its combined expertise in biology and the veterinary and human sciences, the Group was keen to meet Inserm personnel working with and in contact with animals in order to identify in-house concerns on the subject. Indeed, studying representations involves, methodologically speaking, being attentive to what medical research players do with

the animals and therefore to how they talk about and describe their work with them.

The following document combines the outcome of the Group's own initiative with the perceived influence of this context.

Introduction

At first glance, animal testing can be justified by weighing up the expected benefit for humans (or animals in the case of veterinary research) against the price paid by the animals used (stress, pain, suffering, death). We therefore began with the premise that the scientific world – represented in our case by the Inserm community² – accepts the principle that we can work with and experiment on animals. We then extrapolated this premise to the scientific community as a whole, given the genuine step forward represented by the new Directive in the consideration of animals in medical research. This was the idea upheld during meetings between the Inserm Ethics Committee (IEC)³ (our Working Group and members of the Animal Experimentation Office (BEA)⁴) and the CNRS Ethics Committee⁵ concerning the criticisms leveled at medical research by animal rights campaigners and how to respond to them. What position can we adopt in a moral controversy surrounding the use of animals? How can our Working Group contribute? How can it “defend” animal testing? Is justifying the importance of the research really enough?

Indeed, the assertion of this principle – encountered in the meetings we held or participated in – had most probably generated substantial bias in how we approach such ethical reflection. This justification for the experimentation is not just consequentialist, it is also – and above all – principalist: the assertion that human health is superior. That humans have more value than animals. As some contemporary schools of thought discuss and critique this position in absolute or relative terms (from what level of “human utility” would humans consider “animal disutility” to be acceptable?), we considered it pertinent to reposition our initial starting point in order to include this in the scope of our reflection.

Then the following points also attracted our attention. In the world of research, we should be able to distinguish the viewpoint of those designing the projects from those implementing them. Can we assign feelings or sentience to a concept? Manipulating an animal to perform a procedure, whatever that procedure may be, makes it more possible to go from concept to reality, from a scientific construction to a sentient being. Depending on our respective roles in the research programs of this community, how could this impact our representations of animals?

Finally, the diversity of species in a laboratory, while limited in comparison with overall biodiversity, is not neutral in relation to this representation. Nematodes, insects, fish or terrestrial vertebrates, mice, dogs or monkeys, can account for different representations and reactions.

The development of the aforementioned European Citizens' Initiative (also discussed below), as well as the associated reaction of various elements of civil society therefore led us to reconsider the veritable starting point. What should our first question actually be? The difficulty that emerges consists of accepting that what the Initiative wants is not scientific but moral. That being said, it must be accepted that ethics is not a matter of "Science". We need to incorporate moral judgments made by the stakeholders, including by animal rights campaigners. This critical movement is built on an ethic that draws on scientific data about animals (their behavior, suffering, etc.) and bases its arguments on these data (animal ethics).

Can we respond to this directly and if so, how? What strategy should we adopt? How can we respond to European citizens who signed the petition knowing that the question can be legitimate without being scientific? Do we need to address our response to them? Who else should be informed, notified, and through which channels?

We considered that the initial formulation could take one of the following forms or even a combination of the two:

- How does the use of animals in medical research raise moral questions and concerns with the stakeholders? How are they formulated and expressed? How do the stakeholders respond?
- How can the scientific world address the concerns of civil society in this area?

We suggest a four-point plan.

1 - The use of animals in biomedical research, like any use or exploitation of animals by humans, raises a certain number of moral issues.

2 - Reflecting on the European Citizens' Initiative then leads to the question of providing information on these practices and the possible reactions in the face of detractors who do not necessarily seek dialog. How can we use their own communication and media liaison approaches to respond to them and improve how we work with animals?

3 - We will discuss the approach taken by our Working Group as well as the major findings

resulting from it. This is the original part of the elements presented in this document.

4 – Consequently, must we change how we organize medical research work in order to address the moral issues raised by the use of animals in experiments? And if so, how? We are not just talking about communicating with the detractors and with civil society. The aim is to profoundly transform the conditions of the animals and the humans that work with them, particularly surrounding the issue of “replacement”. This certainly begins by talking and listening in-house, within the teams and research units. With the right methods, tools and partners, communication can then develop while attempting to avoid the pitfalls inherent to it.

1. The use of animals in biomedical research

1.1. Problem statement

By following contemporary society debates on the relationships that humans maintain with the animal world, the question that finally emerges is: “what is an animal? “ Indeed, the discussions heard illustrate differences among the protagonists – mainly in perception but also in knowledge and sensitivity, with no apparent concern for bridging the gaps. This rapidly leads to a number of paradoxes.

The great diversity still present in the animal world takes various forms. Depending on the zoological groups, the specialists differ and are also not the only ones interested in these species. In order to grasp this diversity, we see, for example, phylogenic approaches alongside more traditional classifications, or rational approaches alongside more emotional ones. While it can be observed that since recently (2016) the French Civil Code recognizes animals as “sentient beings”, like the Rural and Maritime Fisheries Code, the Environment Code does not. That there is genuine confusion is not surprising. The same common pheasants are recognized as “sentient beings” in scientific research (even in the field) and husbandry but not when released in the run-up to the hunting season.

Conversely, asking whether human beings are animals can also trigger much debate. Essentially, the response would be “yes” for biologists, “yes and no” for anthropologists and philosophers, while remaining in the sciences, including human and social. There are differences between *Homo sapiens* and any other species, as there are between any two species of animal. It is not relevant to always compare an animal species to humans, even in the cognitive sciences. Conversely, the current technological capacities of humans demand necessary reflection on their behavior towards other species.

Clearly, the use of individuals from certain animal species in the field of medical, ecological,

ethological and zootechnical research raises a certain number of societal questions, at least for certain categories of citizens. The image of research with animals must not be limited to that of a closed laboratory and pharmacological testing. Many studies in ecology, ethology, physiology also take place in the field. Wild animals are monitored in their own natural habitats. Some are equipped with marks in order to identify them and sometimes also sensors and various devices able to record large quantities of biological or environmental data. These protocols also raise ethical issues.

The figures in Box 1 give an idea of the numbers of animals farmed, used in research, kept as pets or killed in France each year, including as part of leisure activities. Their uses and purposes are certainly very different but, apart from free-ranging wild animals, all have a legal right to welfare and are recognized as “sentient beings”.

1.2. Animals in research

In purely quantitative terms, the numbers of animals used by biomedical research centers are relatively small compared with those of production animals, companion animals or those killed in hunting. It should be noted that the official statistics are tricky to compare over time, from one survey to another, because the methods of quantification change. Among the various categories of animals (research, husbandry, hunting, etc.) the repercussions for society are difficult to compare and the issue is far from being purely quantitative.

Oddly, and without elaborating on this point too much, these various categories can encounter zootechnical developments that are sometimes quite similar despite the huge differences in their uses. The “construction” (creation and selection) of animals for research (miniature pigs, genetically modified mice) can be reminiscent of some animal husbandry practices (“double-muscled” bovine breeds in which the females cannot calve without cesarean section). Then in the category of companion animals, there are feline and canine breeds that are either non-viable outside of a permanent human environment or selected according to potentially questionable animal-object criteria.

Today, the rules for rearing laboratory animals, their maintenance conditions, are highly regulated. Many standards exist in France and Europe. The research practices themselves are governed by the principles of the 3Rs – replacement, reduction and refinement – which have become standard and are subject to ongoing development and improvement. A national entity, the French Association for Laboratory Animal Science and Techniques AFSTAL (www.afstal.com), is fully dedicated to this. Founded in 1972, this non-profit assists animal testing players with training, getting information and sharing their know-how, the aim being to adopt an ethical conduct and improve in vivo experimentation. AFSTAL has over

500 members. The website of the French interprofessional animal research discussion and communication group GIRCOR (www.recherche-animale.org) is another major source of information. Also a non-profit, GIRCOR brings together French biological and medical research establishments: public research institutions, major institutes, pharmaceutical companies and private research centers.

2. The “Stop Vivisection” European Citizens’ Initiative of 2015

In 2015, a European Citizens’ Initiative to ban the use of animals in biomedical and toxicology research and abrogate Directive 2010/63/EU on the protection of animals used for scientific purposes, obtained over one million signatures for its petition, obliging the European Commission to examine the request and issue a response. The Commission reaffirmed the need to speed up implementation of the principle of the 3Rs and particularly that of the replacement of animals, an ultimate objective that remains premature if we are to continue to advance research and preserve human, animal and environmental health.

Given that vivisection is banned in France and the European Union, it can be noted that the structure behind the initiative – “Stop Vivisection” – uses obsolete and inaccurate terminology. Just the use of this expression can imply a lack of willingness to dialog and a risk of descending into emotion – if that emotion is ill-founded and poorly-controlled – separating us from the issues concerning the protection of the animals used for scientific purposes and the corresponding stakes.

The request associated with the petition does not exactly correspond to scientific questioning because it just involves no longer using animals in research (see Commission Communication of June 3, 2015). Nevertheless, and mainly to issue a response to this Citizens’ Initiative, the European Commission held a two-day scientific conference in December 2016 in Brussels on reducing the use of animals in research. Its exact title was: “Non-animal approaches; the way forward”, evocative of recital (10) of the Directive (see above).

It is interesting to observe that the program announcement explained that the purpose of the conference was to “engage in a dialog with the scientific community on how to exploit the advances in science for the development of scientifically valid non-animal approaches and advance towards the ultimate goal of phasing out animal testing”. Beyond the slightly complex formulation, it can be observed that it was not explicitly stated with whom the scientific community must dialog. In Brussels, with all the speakers and most of the participants being from this community, the dialog was clearly already engaged, at least among them. The scientists who attended also appeared to be satisfied with the conference. It is less easy to know the opinion of those behind the petition, the joint initiators of these meetings, because

they withdrew a few weeks beforehand. Their explanatory letter suggested that the scientific conference no longer corresponded in form and/or in substance to what they had imagined and hoped.

It is possible that when faced with a nonscientific societal request, even one that directly and primarily concerns the scientific world, the best response is not just to hold a scientific colloquium. On the one hand, the response must find the most appropriate routes, both to the context and to the citizens concerned. On the other, the colloquium did enable the Commission to discuss the actual advances in terms of reducing animal use in biomedical research and on the directions to encourage in order to pursue and intensify this approach. There is also Ecopa, the European consensus – platform for alternatives (<http://www.ecopa.eu/>), represented in France by Francopa, the National platform dedicated to development, validation, and dissemination of alternative methods in animal testing (<http://www.francopa.fr>). Francopa is the “alternative methods” GIS [French scientific interest group], supported by the French Ministries of Ecology and Research, the National Institute for Industrial Environment and Risks (INERIS) and the medicines agency ANSM.

To end our discussion on the European Citizens’ Initiative and the administrative procedure in progress, we can report the Decision of the European Mediator 1609/201/JAS of April 18, 2017 which concluded that “There was no maladministration by the European Commission”.

3. Our approach

3.1. Organization of the work

This apparent dichotomy between the scientific and non-scientific communities also appears to be present in France, particularly within an institute such as Inserm. Since the Ethics Committee was set up in 2013, we have sought to get closer to the viewpoints of users, scientists, technicians and laboratory animal caretakers. One initial surprise for us was a certain difficulty in mobilizing around this theme in-house. Holding three days of meetings – two in Paris, one in Montpellier – each time mobilizing a few proactive individuals interested in the issues at hand, proved to be more complicated than expected. This can be interpreted in at least three non-exclusive ways:

- lack of interest in the subject because low-priority
- lack of availability
- no wish to discuss the subject, whatever the reason.

As a result, the sample formed by those who agreed to dialog with us on this occasion must not be considered as statistically representative of the community concerned. There is the risk

of bias, the nature of which unknown.

On each of the three days, the morning was devoted to discussions with designers of research programs that use animals, the afternoon to equivalent discussions with people in direct contact with animals (care, rearing, conduct of procedures) and animal house managers.

Analyzing the results of these interviews nevertheless shows that carrying out such work is not as plain sailing as it might appear. All in all, the people we met are satisfied with the relevance of the research and how it is conducted. The improvements and changes introduced, among other things, since the implementation of the new Directive are appreciated. In parallel, a certain number of questions and observations are emerging. The concept of welfare can and must be applied to both sides – humans and laboratory animals alike. The issue of working animals and working with animals, already explored in livestock farms by some members of our Group, is also encountered here. Here is a summary of these interviews.

3.2. Summarized report of the three days of interviews

Dates: March 31, 2015 (Paris), March 31, 2016 (Paris), May 24, 2016 (Montpellier).

Participants: 24 researchers, 22 technicians

General theme, approach: working relationships with animals. See Appendix 2 for the framework used on March 31, 2016 (Paris), which closely resembles that used on the other two days. The theme was split into two main parts:

- Dealing with social criticism (public sphere, private sphere – family, loved ones, friends)
- Working with animals – this point was developed slightly differently between the scientists and the zootechnicians

The intention was to ask a certain number of pre-identified questions following which the discussions were open for everyone to express themselves. However, even in-house, it did not always appear easy for people to be completely open. Several points did nevertheless emerge and were reinforced from one discussion to the next.

- The participants all agreed on the concept of the research being performed in the general interest.
- The new rules, those of the Directive of 2010 – which came into force in France in 2013 – were generally well received. The reinforcement of the standards was, however, sometimes perceived as heavy, even counterproductive, but this was a minority view. The regulatory requirement for animal experimentation training was considered to be highly justified even if some of the participants (for example, doctors) sometimes found it useless in their case.
- Making provision to talk within the teams appeared essential, for all personnel.

- The development of technical platforms, separate from the laboratories and research units, was seen to complicate dialog and possibly contradict the preceding point. Confinement in isolated areas, albeit well accepted in terms of biosafety, was nevertheless perceived with reticence. The closed areas were considered very restrictive.
- The compartmentalization of the tasks associated with the industrialized production of animals contributes to workplace dehumanization. This is found in some systematic testing methods for new molecules, which require the use of a large number of animals.
- Evolutions in legislation, organization and practices have led to a change in habits, which is sometimes tricky but should resolve with the arrival of the latest generations with their raised awareness.
- Primates really raised specific issues in relation to other mammals, then mammals in relation to the other zoological groups, and companion animals in relation to other types of animals. The existence of “mascots” – animals to which the staff becomes attached and which are kept beyond the initial protocols – appears difficult to avoid. A practice that may be partially justified or necessary because their presence and care possibly positively compensate for what must be done elsewhere. Can we liken it to the small temples present in Japanese research laboratories? A ceremony is held each year to express genuine recognition towards the animals for their contribution to the research performed.
- “Sacrificing” the animals remains a difficult moment. The terminology itself (*mise à mort* in French), imposed by the Directive, is difficult to live with for staff.
- The practical organization of the work can present problems as well as the way it is talked about. We need to think about the links to external life, for example, without it excessively representing two different unconnected lives. At this level there is genuine workplace suffering for some humans which must be taken into account and given as much attention as the issues related to animal welfare. The techniques used to sacrifice animals remain delicate, particularly due to their volume and justification that is not always explicit. The official figures published by the French Ministry of Research concerning the number of animals used systematically underestimate the reality because they do not take into account the animals produced and eliminated for non-compliance (male/female, homozygote/heterozygote, etc.) or the animals used outside of the procedure (sacrifice of animals for tissues or organs). Some humans suffer as a result of this “hypocrisy” that is also encountered in livestock farms (male chicks and male kids destroyed at birth, for example, and not counted in the official statistics).
- There may be a difference of perception between technicians – in permanent contact with the animals, not strongly invested in the choice of research questions and without the underlying motivations – and researchers. This hierarchical gap is important because it is a good illustration that – depending on the role held, the context, the issues to be managed – the moral standards in the relationship to the animals are not the same. This conflict of

standards is reminiscent of another conflict – even if the terms are different – the one between a certain section of society and scientists.

- Communication on the use of animals appears essential but tricky. Not everyone has the same ease or legitimacy in talking about it. It is sometimes easier to know what not to say than what to say. In all cases, the teams concerned need clear directives from the institutions.
- The ethical deliberation on the use of animals in research is, of course, not just a question of communication, but communication can feed on it.

4. Discussion

4.1. How to work with animals in medical research

The initial idea was based on the principle that a priori, because the scientific world – represented here by the Inserm community – accepts the principle that we can work with and experiment on animals, it can be extrapolated to society as a whole. It would appear that this is not the right starting point. The question of the utility of “animal models” in medical research, posed by society, or at least part of it, even when formulated non-scientifically, must be considered legitimate. The responses must not deny the relevance or irrelevance of the question once real educational work has begun.

The difficulty lies in the potential incompatibility of a scientific response to an unscientific question and also in the fact that some opponents do not look for dialog. If the question asked was only moral, or societal, what would be the best way to address it? It also cannot be reduced to elements of language or communication. In the study of diseases affecting both humans and various animal species (zoonoses) or in the case of transplants, the scientific approach is understandable and possibly easier to accept. The elements appear more complex to elaborate on and must be well selected in terms of toxicology. Nevertheless, technical arguments are available in all cases.

One well-documented example is that of the research developed during the mad cow crisis thanks to the “humanized” mouse model. A deeper understanding of prion diseases – a veritable fundamental and applied challenge – together with a very long latency period in the development of the disease (months with mice, years with bovines and humans), was possible thanks to this mouse model.

The case of cosmetology is more or less regulated and must not be systematically associated with that of medical research. Nevertheless, within the scope of the REACH⁶ regulation, the toxicity of basic molecules remains to be tested and continues in many cases to include an animal phase. The development of alternative methods is encouraged at this level also.

The overall impression is that the majority of researchers accept the legitimacy of the changes in the regulations, the ongoing improvement in practices and the reinforcement of the principles of the 3Rs. However, they do not understand the question very well because it is not scientific and comes from another social domain. As a result, there is sometimes awkwardness of communication, communication that is perceived as essential, requiring real “professionals”, for both the form and the substance. For some detractors, calling into question the animal model no doubt corresponds to poor comprehension of the concept of the model and of comparison. Comparing the clinical, immune and physiological developments of a human being and an individual from a certain animal species is always enriching, whether these developments are identical, parallel or different. Indeed, in the first case, developments occurring in one can directly help to anticipate developments in the other. In the latter case, differences can make it possible to discover and understand new mechanisms whose applications may become beneficial to others.

If necessary, we could still use the most recent elements derived from research on the very origin of life, on links uniting bacteria, archaea and eukarya well as the natural transfers of genes that reinforce both the concepts of symbiosis and unicity of the processes of living organisms as known on earth. As it is understood at present, the life present on our planet corresponds to a unique phenomenon that has considerably diversified but maintains real unicity in its fundamental mechanisms.

Finally, all noted that the hierarchy within the animal species imposed by some of their defenders could also pose moral issues. A monkey is more moving than a dog, which in turn is more moving than a mouse, a fish, and so on and so forth.

4.2. Research, ethics, communication and animals

When evoked regularly, these concepts of information and communication surrounding research with animals raise a certain number of issues themselves. Do they need to be the subject of a specific study, initiative or a paragraph of text? Without claiming that the debates and oppositions could be appeased and resolved only by the appropriate information and communication, by “the right” communication, we nevertheless need to avoid reducing the issue to a simple question of form while draining the substance.

The CNRS colloquium *Regards croisés sur la relation Humain Animaux* held on October 5, 2016 is an apt illustration of the difficulties encountered at this level. It was opened and closed by a CNRS communications manager. It ended with the projection of a one-sided video in which a series of scientists explained in good faith the utility of their research and the evident use of animals without the slightest doubt and outside of all open and potentially contradictory

discussion. In the debate that followed, in the conference room, some did not understand that it was possible to criticize this absence of opposition. Yet the argument was only to be able to get closer to the actual associated ethical issues.

Conclusion

Following this discussion and after analysis of the interviews, we do not claim to provide a definitive response to the questions raised throughout. We were sometimes surprised by the discussions generated and by the variety of official tools dedicated to these issues, tools which the uninitiated are not always aware of – for instance, Francopa.⁷

The European Citizens' Initiative was also a source of inspiration! Its emergence appeared to be a source of concern for the research structures. The responses appeared to swing between information-education and communication.

Is it the perception itself of the use of animals in research by the researchers which poses a problem? Or their difficulty hearing the societal question? The only current academic response appears inadequate. Maybe we just need to inform the public better, improve how we help it to inform itself. With whom? How? In what ways, on what occasions?

Must the discussion be limited to the scientific community or try to go beyond it? The critical initiatives opposed to the use of animals in research are attempting to occupy the public arena. Are we equipped to do the same? Do we have the legitimacy to go there?

The current relevance of the animal models is well accepted by the scientific community and can be explained to society. Two completely different questions must be acknowledged:

- Is it effective?
- Is it moral?

In response to this, could we replace the binary "yes/no" response by an approach that is useful, weighted, negotiable and transparent?

If access to knowledge is a right inherent to our democracies, then we must recognize the current importance of using animals in research. Much progress has been made by working with them and not just in biomedical research. This is true for the human species as it is true for other species (veterinary research).

The social pressure, even when driven by emotions and concerned about the fate reserved for these animals, is a reality. This pressure is also of a nature to reinforce rules such as the

principles of the 3Rs and can therefore have a positive effect on the development of the initiative. It is a system that can be mutually beneficial for everyone, animals included.

The patient associations can provide an important and legitimate message regarding these questions. An initial measurement of societal perception was made by the Inserm Organizations, Research & Society Interface (MARS) and GIRCOR, through a survey of the Inserm patient associations network: the preliminary findings highlighted that the three-quarters of the associations having responded considered animal use in biomedical research a priority subject on which they wished to obtain information, particularly on the limits of the alternative methods (3Rs) and the current regulation of procedures. Clarifications that they consider should come from research institutes. The vast majority of the associations considered that working groups comprising researchers and members of civil society would further this debate. Nine of these associations wrote a letter to the French Minister of Research in September 2017 asking her to support the use of animals in research programs dedicated to their diseases when that appeared necessary.

Information and scientific rationale are essential for the understanding of elements that drive research, and the use of animals is an integral part of this. To challenge their use is to challenge the medical advances that aim to benefit all citizens, their animals and all the others. However, the ethical question persists and while it may sometimes appear overlooked by scientists, it is no less present.

While society understands the utility of animal models, it still awaits real consideration of their concerns by scientists. How must the stakeholders, scientists, zootechnicians present themselves in a situation from which they can be victims themselves, a situation which can sometimes represent a source of major suffering? One lesson is, of course, the malaise of some of the personnel working with animals. Improving these working conditions goes hand in hand with the desire to steadily reduce the use of animals in experimental procedures.

Regardless of the various viewpoints concerning the use and representation made of animals in medical research, it appears important to properly focus the debate to make it a collective issue, without pitting society against scientists, “good” against “bad” or ethics against research. These are potential avenues for future developments.

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Some references

- Afeissa H-S, Jeangène Vilmer J-B (coords) (2010) *Philosophie animale. Différence, responsabilité et communauté*. Librairie philosophique J Vrin, Paris, 380p.
- Arnaud J-D et al. (2016) Manager un service de zootechnie : quelques conseils pour favoriser la qualité de vie au travail. *STAL*, 2^e trimestre 2016, 42 : 1-8.
- Bane M, Lis L (coords) (2014) Pointée du doigt la recherche animale reste indispensable. *CNRS Le journal*, Grand Format, 277 : 30-36.
- Baptiste Eric (2013) *Les gènes voyageurs*. Belin, Paris, 254p.
- Bekoff M, Pierce J (2009) *Wild justice. The moral lives of animals*. The University of Chicago Press, Chicago, 188p.
- Blay M (coord) (2015) L'animal, enjeu de la recherche. *Histoire de la recherche contemporaine*, Dossier, IV (1) : 4_68.
- Collectif (2006) *Le bien-être animal*. Editions du Conseil de l'Europe, Regard éthique, Strasbourg, 296p.
- Debuire B, Hirsch E (coords.) (2004) *La recherche peut-elle se passer d'éthique ?* Université Paris-Sud 11, Orsay, Espace éthique/AP-HP, Paris, Librairie Vuibert, Paris, 126p.
- Delon N (2013) Pour une éthique animale descriptive. *Klesis – Revue philosophique*, 27 : 118-154.
- Dupuy Maury F (coord) (2016) Recherche animale. Pourquoi est-elle encore essentielle ? *Science et Société*, Grand Angle, 30 : 22-35.
- Jeangène Vilmer J-B (2008) *Ethique animale*. Presses Universitaires de France, Paris, 305p.
- Kymlicka W, Donaldson (2016) *Zoopolis. Une théorie politique des droits des animaux*. Alma, éditeur, Paris, 407p.
- Michalon J (2017) Les *animal studies* peuvent—elles nous aider à passer l'émergence des épistémès réparatoires ? *Revue d'anthropologie des connaissances*, 11 (3) : 321-349.
- Mouret S (2012) *Elever et tuer des animaux*. Presses Universitaires de France, Paris, 209p.
- Nagel T (2012) *Mortal questions*. Cambridge University Press, Cambridge, 315p.
- Noble D, Vincent J-D (coords) (1998) *L'éthique du vivant*. Editions UNSECO, Paris, 254p.
- Pelluchon C (2011) *Eléments pour une éthique de la vulnérabilité. Les hommes, les animaux, la nature*. Les éditions du Cerf, Paris, 349p.

- Porcher J et al. (2014) *Le livre blanc pour une mort digne des animaux*. Les Editions du Palais, Paris, 108p.
- Regan T (2012) *Les droits des animaux*. Herman éditeurs, Paris, 750p.
- Rémy C (2006) Pratique sacrificielle et activité scientifique. Enquête ethnographique dans un laboratoire de physiologie. *Sociologie du travail*, 48 : 226-239.
- Selosse Marc-André (2017) *Jamais seuls. Ces microbes qui construisent les plantes, les animaux et les civilisations*. Actes Sud, Arles, 364p.
- Singer P (199) *La libération animale*. Grasset, Paris, 383p.

Notes

¹Public establishments of a scientific and technological nature

²French National Institute of Health and Medical Research

³Inserm Ethics Committee

⁴Animal Experimentation Office

⁵French National Center for Scientific Research

⁶ Registration, Evaluation, Authorization and restriction of CHemicals (REACH) “is a regulation of the European Union, adopted to improve the protection of human health and the environment from the risks that can be posed by chemicals, while enhancing the competitiveness of the EU chemicals industry. It also promotes alternative methods for the hazard assessment of substances in order to reduce the number of tests on animals.”

⁷Francopa: French platform dedicated to the development and dissemination of alternative methods in animal testing

Box 1 Some figures on the various uses of animals in France

Production animals in France

Source: Agreste, year 2014, French Ministry of Agriculture

	<i>Reared</i>	<i>Slaughtered</i>
Bovine	19,300,000	5,800,000
Ovine	7,200,000	4,200,000
Caprine	1,250,000	719,000
Porcine	24,100,000	23,700,000
Poultry	1,100,000,000	935,100,000

Animals used for and by research in France

Source: 2014 and 2015 statistical surveys, French Ministry of Research (in French)

<http://www.enseignementsup-recherche.gouv.fr/cid70613/www.enseignementsup-recherche.gouv.fr/cid70613/enquete-statistique-sur-l-utilisation-des-animaux-a-des-fins-scientifiques.html>

Species	2014	2015
Mice	853,555	1,007,245
Fish	524,024	413,183
Rats	131,722	157,309
Rabbits	88,334	108,110
Guinea pigs	36,152	44,414
Primates	1,103 ^a	3,162 ^c
Birds	92,776 ^b	113,167 ^d

^a I.e. 845 cynomolgus monkeys, 149 baboons, 36 rhesus monkeys, 14 old world monkeys, 4 squirrel monkeys, 55 prosimians.

^b Including 48,528 domestic chickens

^c Including 2,756 cynomolgus monkeys, 157 prosimians, 97 marmosets and tamarins, 64 rhesus monkeys, 56 old world monkeys, 19 baboons, 13 squirrel monkeys

^d Including 66,734 domestic chickens

Companion animals in France

Source: 2015 press release, French trade federation of food manufacturers for dogs, cats, birds and other pets FACCO (<http://www.facco.fr/>,)

Cats	12,680,000
Dogs	7,260,000
Small mammals	2,840,000
Birds	5,750,000

Some figures (estimations) from the 2013-2014 kill counts, for 6 mammals and 6 birds out of a total of 90 species for which hunting is authorized in France

Source: French National Hunting and Wildlife Agency ONCFS (www.oncfs.gouv.fr)

Wild boar	724,000
Red deer	63,000
Roe deer	590,000
Chamois	16,500
Fox	430,000
Wild rabbit	1,500,000

Wood pigeon	5,000,000
Common pheasant	3,000,000
Song thrush	1,500,000
Mallard	1,200,000
Red-legged partridge	1,274,000
Gray partridge	967,000

Appendices

Appendix 1: European Directive 2010/63/EU

<https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:276:0033:0079:en:PDF>

Appendix 2: Program used for the three days of meetings:

Example: Framework of the March 31, 2016 interviews in Paris

RESEARCHERS

A. Dealing with social criticism

1. THE PUBLIC SPHERE
2. THE PROFESSIONAL SPHERE
3. THE PRIVATE SPHERE

B. WORKING WITH ANIMALS

1. BETWEEN DISTANCE AND PROXIMITY
2. ACCEPTING THE VIOLENCE INHERENT TO THE WORK
3. STANDARDIZATION: THE PRINCIPLES OF THE 3Rs (TO BE ELABORATED)
4. MANAGING WORKPLACE SUFFERING TOGETHER (TO BE ELABORATED)

LABORATORY ANIMAL CARETAKERS

A. WORKING WITH ANIMALS: FROM PLEASURE TO SUFFERING

- 1. THE NASCENT LIVES OF ANIMALS: A SOURCE OF SATISFACTION AT WORK**
- 2. THE VIOLENCE INHERENT TO THE WORK: ETHICAL SUFFERING**

B. The collective organization of work

- 1. DEALING WITH ETHICAL SUFFERING TOGETHER**
- 2. WORKING RELATIONSHIPS WITH RESEARCHERS**
- 3. THE *IN VIVO* TESTING MODEL: A PROFESSIONAL CONTROVERSY**
- 4. THE WITHDRAWAL OF ANIMALS: AN ALTERNATIVE TO THE VIOLENCE OF THE WORK**

C. DEALING WITH SOCIAL CRITICISM